MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2015/2016

EME3066 – CAD/CAM

(ME)

16 OCTOBER 2015
3:00 p.m. – 5:00 p.m.
(2 Hours)

INSTRUCTION TO STUDENT

1. This Question paper consists of 4 pages including cover page with 4 Questions only.
2. Answer **ALL FOUR** questions. All questions carry equal marks and the distribution of the marks for each question is given.
3. Please write all your answers in the Answer Booklet provided.

Question 1

(a) Geometric Modeling involves the use of a CAD Geometric modeling system to develop a mathematical description of the geometry of an object. Briefly explain what should be the basic requirement of Geometric Modeling? **[8 Marks]**

(b) In Geometric Dimensioning & Tolerances (GD&T), a feature control frame is required to describe the conditions and tolerances of a geometric control on a part's feature. Read the complete tolerance in each feature control frame in Fig. Q1, and list them out (datum feature A is a feature of size). **[8 Marks]**

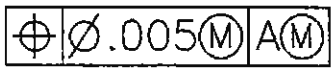

Fig. Q1: Material condition symbols

(c) Geometric transformation is a change in geometric characteristics such as position, orientation and size of a geometric entity. By using sketch, briefly explain any 3 of geometric transformations. **[9 marks]**

Question 2

(a) One of the important clamping fixtures for CNC machining center is Grid Plate. Briefly explain with a sketch what it is and state three other practical methods for holding work-piece. **[10 marks]**

(b) It is important to do tool presetting in setting up a CNC machining. What is the purpose of tool presetting? Briefly describe with a sketch the tool pre-setters that you are familiar with. **[6 marks]**

(c) There are 3 different types of tool magazines used in CNC machine tools. List all of them and give one of their advantages each. **[9 marks]**

Continued ...

Question 3

(a) State the six techniques available under the Rapid Prototyping Process. **[9 marks]**

(b) With the aid of a diagram, explain how can you reduce time and cost as a result of integrating Rapid Prototyping Technologies into a conventional system. **[16 marks]**

Question 4

(a) Process plan is a detailed plan of the steps involved in manufacturing (machining) a given part. Name the 4 important contents of a process plan. **[4 marks]**

(b) For the component shown Fig. Q4, make a part program for machining on a CNC machining center equipped with the ISO controller using absolute programming. Choose the datum "A" as the origin of the part and cut in "clockwise direction". (All dimensions in mm) **[21 marks]**

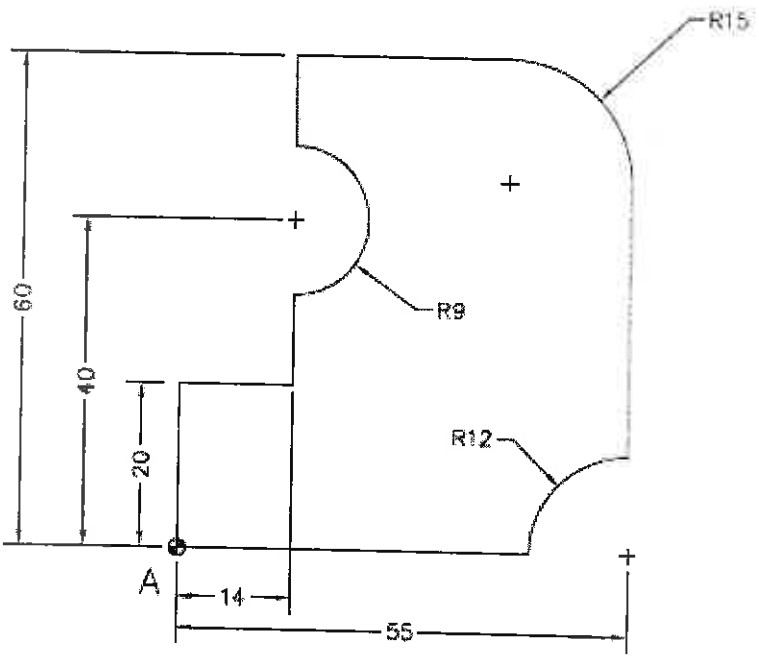

Fig. Q4

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Appendix : Description of G codes and M codes (*Milling*)

G00 Rapid Traverse or Fast Traverse	M00 Program Stop
G01 Linear Interpolation or Slow Traverse	M02 Program End
G02 Circular Interpolation, CW	M03 Spindle on Clockwise
G03 Circular Interpolation, CCW	M04 Spindle On Counterclockwise
G04 Dwell	M05 Spindle Stop
G17 XY Plane Selection	M06 Tool Change
G18 ZX Plane Selection	M08 Coolant On
G19 YZ Plane Selection	M09 Coolant Off
G20 Imperial Units (Inches)	M10 Work Clamp On
G21 Metric Units	M11 Work Clamp Off
G28 Goto Reference Point	M13 Coolant Spindle Fwd
G40 Cancel Tool Radius Compensation	M14 Coolant Spindle Rev
G41 Left Hand Radius Compensation	M30 Program Stop, Reset To Start
G42 Right Hand Radius Compensation	M98 Subprogram Call
G73 Past Peck Drilling Cycle	M99 Subprogram Exit
G74 Counter Tapping Cycle	
G84 Tapping Cycle	
G85 Boring Cycle	
G90 Absolute Positioning	
G91 Incremental Positioning	
G92 Set Datum	
G94 Per Minute Feed	
G95 Per Revolution Feed	
G98 Initial Level Return	
G99 R Point Return	

End of Paper.